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(54) Fabric for clothing and footwear items

(57) A fabric for a clothing and footwear item, having a structure that comprises an inner layer (10), which acts as a lining and is made of a material adapted to distribute condensed perspiration on a large surface, an intermediate spacer layer (11) made of a material adapted to transfer the condensed perspiration from the inside of the item outward, and an outer layer (13) made of a material adapted to distribute the condensed perspiration on a very large surface so as to cause its immediate evaporation. The three layers (10,11,13) are integrated so as to form a single element (14).

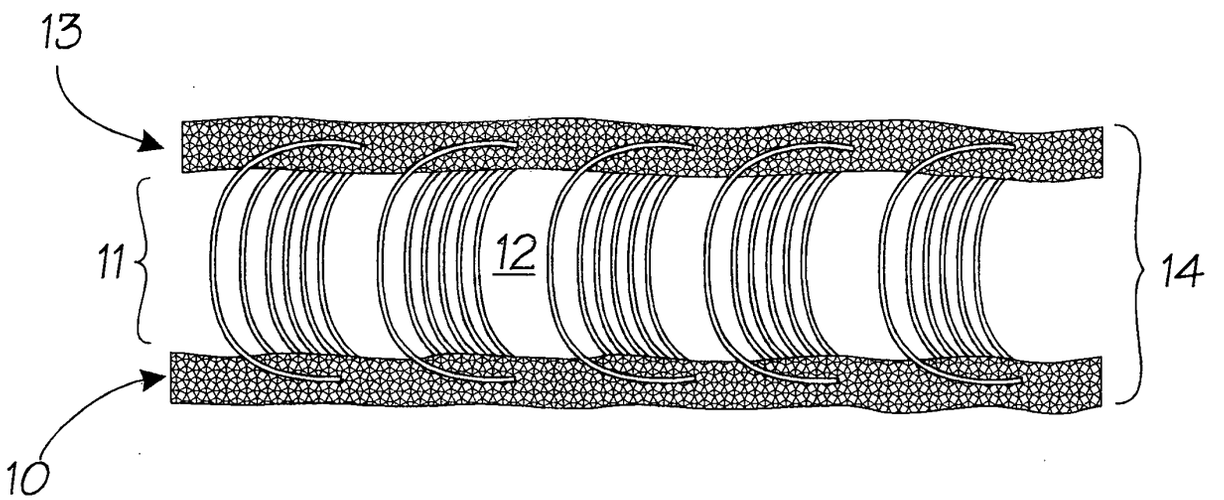

Fig. 1

EP 1 266 584 A1

Description

[0001] The present invention relates to a fabric, particularly for clothing and footwear items.

[0002] It is known from EPA 00951344.1 of July 5, 2000 that it is possible to make clothing items characterized in that they comprise a protective external covering and an inner layer which defines an interspace with access holes at the regions of the body that produce perspiration more abundantly.

[0003] With such a structure, the items allow convection of the warm air and vapor normally produced by the body and allow to expel these elements externally by means of holes which are located in the upper regions of the garments and on which devices are placed which keep out water, impurities or other matter.

[0004] Although they are commercially appreciated, these clothing items have nonetheless shown limitations that have prevented their widespread diffusion.

[0005] The manufacture of items having the structure described above is in fact rather complicated and expensive, since it requires many operations for cutting and stitching the various fabrics that constitute the system (at least two, i.e., the outer covering and the layer that defines the interspace, but usually three, including an inner lining that is almost always present).

[0006] Another limitation of the current structure is that items are obtained that are not always acceptable from an aesthetic standpoint, as well as in terms of fit: they are in fact bulkier and more rigid than normal clothing items of the same kind, and therefore hinder movement.

[0007] For these reasons, the structure according to the above mentioned European Patent Application is not altogether suitable for garments, such as knitted items, which require particularly soft and physiologically high-performance fibers.

[0008] Another problem that is observed is that current garment structures are not capable of eliminating perspiration that has condensed and accordingly has converted into liquid, since it provides an interspace made of fibers that are not intended specifically for this purpose.

[0009] The aim of the present invention is to provide a fabric by means of which it is possible to provide clothing and footwear items, solving the problems mentioned above of the known fabric types.

[0010] Within this aim, an object of the present invention is to provide a fabric by means of which it is possible to provide clothing and footwear items at low cost.

[0011] A consequent primary object is to provide a fabric by means of which it is possible to produce clothing and footwear items with a simpler manufacturing process.

[0012] Another object is to allow, for all purposes, the natural thermoregulation of the human body.

[0013] Another object is to provide a fabric by means of which it is possible to produce clothing and footwear items that have better fit and are physiologically more comfortable.

[0014] This aim and these and other objects that will become better apparent hereinafter are achieved by a fabric for clothing and footwear items, having a structure characterized in that it comprises:

an inner layer, which acts as a lining and comprises at least a material adapted to distribute condensed perspiration on a large surface;
an intermediate spacer layer, which comprises al least a material adapted to transfer the condensed perspiration from the inside of the item outward;
an outer layer, which comprises at least a material adapted to distribute the condensed perspiration on an extended surface so as to enable its immediate evaporation and consequently regenerate the entire wearing system;

said layers being integrated to form a single element.

[0015] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of nonlimitative example in the accompanying drawing, wherein:

Figure 1 is an enlarged-scale sectional view of a fabric according to the invention.

[0016] With reference to the figure, a fabric according to the invention has a structure that comprises an inner layer 10, which acts as a lining, and comprises at least a material adapted to distribute condensed perspiration on a large surface.

[0017] For this purpose it is possible to use, in an exemplary embodiment, fibers of hydrophilic-treated polyester, i.e., polyester treated with substances capable of reducing the surface tension of water with respect to said fibers.

[0018] The fabric also comprises an intermediate spacer layer 11, which forms an interspace 12.

[0019] The intermediate layer 11 comprises at least a material adapted to transfer the condensed perspiration from the inside of the item outward.

[0020] For this purpose it is possible to use fibers made of a material adapted to convey water and/or vapor without absorbing it, such as for example fibers that are made hollow and/or are provided with longitudinally arranged external fins.

[0021] It is thus possible to use particular synthetic textile fibers, that are per se known or commercially available and which, due to their own inherent nature and also due to their particular physical shape, are adapted to transport water or liquid along and through their structure (for example the Coolmax® fiber, a trademark of Dupont).

[0022] Such fibers are also adapted to absorb large

amounts of water both inside their structure (absorption) and on their surface (adsorption), allowing water distribution on a very large surface.

[0023] As an alternative, or in combination, it is possible to use fibers that are capable of performing the water transport along and through their structure as a consequence of treatments to which they are subjected (treatment based on available substances which are known to be suitable for reducing the surface tension of water).

[0024] The fabric also comprises an outer layer 13, which comprises fibers of at least a material adapted to distribute the condensed perspiration on a very large, i. e. extended surface, so as to enable its immediate evaporation and consequently provide a regeneration of the entire wearing system, by restoring it to a fresh, comfortable condition.

[0025] It is possible to use, for this purpose, fibers of polyamide (microfiber) known and commercially available by the name Tactel, a trademark of Dupont, hydrophilic-treated polyester fibers, viscose, or equivalent materials.

[0026] The layers 10, 11 and 13 are integrated by weaving 16, forming a double-jersey monolithic fabric 14.

[0027] Since the outer layer 13 is a component which must also have a fancy appearance that meets various fashion requirements, and must therefore vary, in terms of color, weight, structure and composition, it is possible to provide for the lamination or coating, onto the finished product 14, on the side of the outer layer 13, for example by means of spots of adhesive or other equivalent methods, of an additional layer 15 (shown with interrupted line) that can perform the aesthetic and/or technical functions (if said additional layer comprises, for example, a membrane that is impermeable to water and permeable to vapor) that an item of clothing must have, thus allowing a further advantage in terms of production.

[0028] By producing a clothing or a footwear item with the described fabric, the perspiration produced by the body is distributed, but not absorbed, on the lining, is transported, but not absorbed, through the spacer fibers, and then distributed onto the outer layer in order to facilitate its evaporation.

[0029] Therefore, the clothing or footwear item is adapted to dissipate warm air and vapor-phase perspiration in addition to any condensed (liquid) perspiration.

[0030] In practice it has been observed that the intended aim and objects of the present invention have been achieved.

[0031] With respect to the prior art, a single fabric is so provided, which is adapted to act, or being used, at the same time as an interspace, as an outer layer (face fabric), and as an inner layer (lining).

[0032] Accordingly, fabrication costs are reduced, items being manufactured with a simpler production process, and fit and physiological comfort of the items are improved.

[0033] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0034] All the details may further be replaced with other technically equivalent elements.

[0035] In practice, the materials used, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

[0036] The disclosures in Italian Patent Application No. PD2001A000144 from which this application claims priority are incorporated herein by reference.

[0037] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A fabric for clothing and footwear items, having a structure **characterized in that** it comprises:

   an inner layer (10), which acts as a lining and comprises at least a material adapted to distribute condensed perspiration on a large surface;
   an intermediate spacer layer (11), which comprises at least a material adapted to transfer condensed perspiration from the inside of the item outward;
   an outer layer (13), which comprises at least a material adapted to distribute condensed perspiration on an extended surface so as to enable immediate evaporation thereof and consequently regenerate the entire wearing system;

   said layers (10,11,13) being integrated to form a single element (14).

2. The fabric according to claim 1, **characterized in that** said inner layer (10) comprises hydrophilic-treated polyester fibers.

3. The fabric according to claim 1, **characterized in that** said intermediate layer (11) is made of hollow fibers and/or fibers provided with outer fins that are arranged longitudinally.

4. The fabric according to claim 1, **characterized in that** said intermediate layer (11) comprises per se known synthetic textile fibers which have a structure and a particular physical shape, such as to provide water or liquid transport along and through their structure.

5. The fabric according to claim 1, **characterized in**

that said intermediate layer (11) comprises synthetic textile fibers which are treated with substances suitable for reducing the surface tension of water, so as to become adapted to transport water along and through their structure.

6. The fabric according to claim 1, **characterized in that** said outer layer (13) comprises fibers of polyamide microfiber, and/or hydrophilic-treated polyester fibers and/or viscose fibers and/or equivalent fibers.

7. The fabric according to claim 1, **characterized in that** comprises an additional layer (15) laminated on said outer layer (13) to perform any aesthetic and/or technical functions required for a clothing or footwear item.

8. The fabric according to claim 1, **characterized in that** said layers (10,11,13) are integrated by a weaving (16), so as to form a monolithic double-jersey fabric (14).

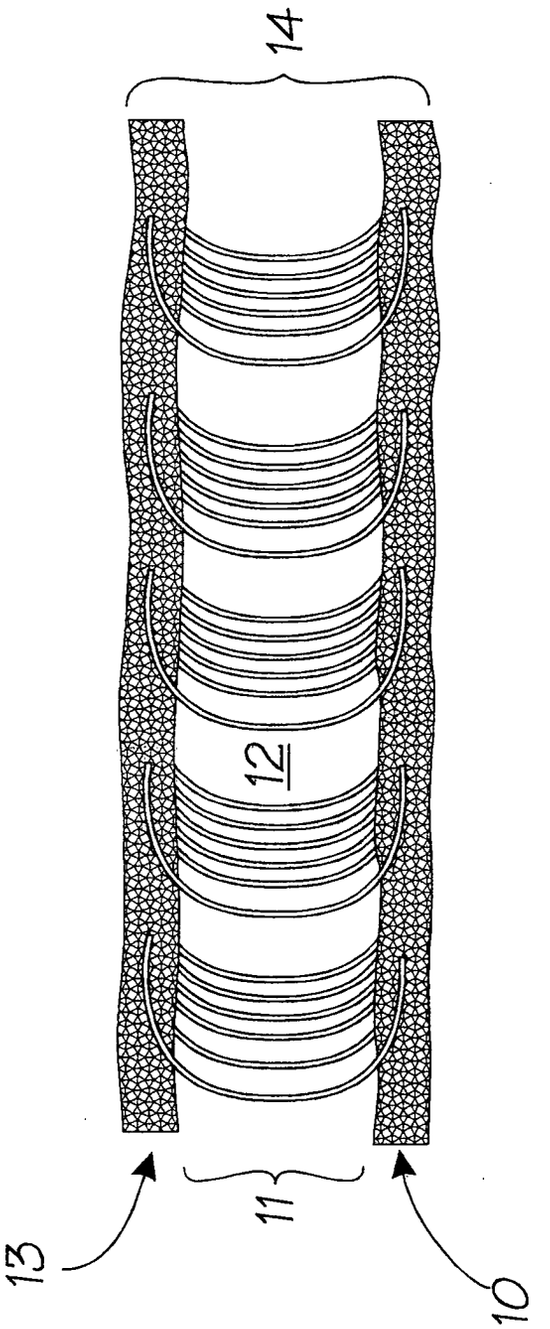

Fig. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 02 01 2372

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 896 758 A (LOHMUELLER KARL ET AL) 27 April 1999 (1999-04-27) * column 1, line 7,8 *	1,2,4-6	A41D31/02 D04B1/22
Y	* column 2, line 4 - column 3, line 5; claims 1-7,10,16 *	3	
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X	DE 196 35 170 C (TEXTILFORSCHUNGSINSTITUT THUER) 18 September 1997 (1997-09-18) * column 1, line 3 - line 10 * * column 1, line 63 - column 2, line 2 * * column 2, line 63 - line 65 * * column 3, line 50 - line 58 * * column 4, line 1 - line 12; claims; figure 5 *	1,3,4,6	
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	3 September 2002	Uhlig, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 01 2372

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82